

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A Web service coordination plan creating apparatus, comprising:

a first storage section ~~which stores~~ configured to store user data ~~that makes~~ arranged as predicates having predicate arguments, each predicate argument indicating a states value representing a state of a user;

a second storage section ~~which stores~~ configured to store a database that associates preconditions representing, in predicate form, necessary conditions for users to use Web services via an information communication network, with post conditions representing, in predicate form, the effects of invocation of the corresponding Web services, the precondition and post condition predicates in the second storage including predicate arguments represented as variables; and

a coordination plan creating ~~means for, when receiving~~ section configured to  
receive a user's request including search conditions for the Web services,  
~~acquiring~~ acquire, from the first storage section, matching user data in  
predicate form corresponding to the user's request ~~from the first storage section,~~  
~~acquiring~~ acquire, from the second storage section, a combination of Web  
services which satisfies the user's request by logically combining ~~the~~ preconditions  
and post conditions for a plurality of Web services including a first Web service  
having ~~the preconditions~~ a precondition matching ~~with~~ the user data and a second  
Web service having ~~the~~ a post conditions condition matching ~~with the user data~~ user's  
request, and

unify the preconditions and post conditions for the plurality of Web services  
acquired from the second storage section by replacing each predicate argument

represented as a variable with a corresponding predicate argument representing a value of the state of the user acquired from the first storage section, each occurrence of a same variable being replaced with a same value of the state,

~~creating~~ create a Web service linking plan that indicates a sequence of performing the combination of Web services using the unified preconditions and post conditions, where the ~~first~~ second Web service included in the combination of Web services is arranged to be performed after the ~~second~~ first Web service included in the combination of Web services, ~~based on an order of the logical combination, and~~  
transmit the Web service linking plan to the user.

Claim 2 (Currently Amended): The Web service coordination plan creating apparatus according to claim 1, wherein

the coordination plan creating ~~means carries out~~ section is further configured to perform

a first process of matching the predicate of the precondition with the predicate of the user data and matching the predicate of the post condition with the predicate of the user's request in respect to one Web service, and

a second process of matching the predicate of the precondition with a first predicate including the predicate of the user data unmatched in the first process and matching the predicate of the post condition with a second predicate including the predicate of the user's request unmatched in the first process in respect to other Web services excluding the one Web service.

Claim 3 (Currently Amended): The Web service coordination plan creating apparatus according to claim 2, wherein

the coordination plan creating ~~means-carries-out~~ section is configured to perform the second process by calling the first process recursively.

Claim 4 (Currently Amended): The Web service coordination plan creating apparatus according to claim 1, wherein

the coordination plan creating ~~means-carries-out~~ section is configured to perform

a first process of matching the predicate of the precondition with the predicate of the user data and matching the predicate of the post condition with the predicate of the user's request in respect to one Web service, and

a ~~third~~ second process of matching the predicate of the post condition with a third predicate including the predicate of the user's request unmatched in the first process in respect to other Web services excluding the one Web service.

Claim 5 (Currently Amended): The Web service coordination plan creating apparatus according to claim 4, wherein

the coordination plan creating ~~means-carries-out~~ section is configured to perform the ~~third~~ second process by calling the first process recursively.

Claim 6 (Currently Amended): The Web service coordination plan creating apparatus according to claim 1, further comprising:

a third storage section ~~which stores~~ configured to store an ontology dictionary where a plurality of predicates describing each state by predicate logic notation are classified hierarchically in database form, wherein

the coordination plan creating ~~means-creates~~ section is configured to create matching user data by changing the predicate included in the user's request according to a hierarchical level in the ontology dictionary.

Claim 7 (Currently Amended): A method of creating a Web service coordination plan, comprising steps of:

storing user data arranged as predicates having predicate arguments, each predicate argument indicating a value representing a state of a user;

~~creating method which uses user data that makes predicates indicating the states of users and~~

storing a database that associates preconditions representing, in predicate form, necessary conditions for users to use Web services via an information communication network, with post conditions representing, in predicate form, the result of ~~receiving the Web services to correspond to the~~ invoking the corresponding Web services, ~~the Web service linking plan method comprising: the precondition and post condition predicates in the second storage including predicate arguments represented as variables;~~

~~a first step of, when receiving a user's request including search conditions for the Web services[[],];~~

~~acquiring matching user data in predicate form corresponding to the user's request from a first storage section;~~

~~a second step of acquiring from the second storage a combination of Web services which satisfies the user's request by logically combining the preconditions and post conditions for a plurality of Web services including a first Web service having the preconditions~~ a precondition matching with the user data and a second Web service having ~~the~~ a post conditions condition matching with the user data user's request; and

unifying the preconditions and post conditions for the plurality of Web services acquired from the second storage section by replacing each predicate argument represented as a variable with a corresponding predicate argument representing a value of the state of the user acquired from the first storage section, each occurrence of a same variable being replaced with a same value of the state;

a ~~third step~~ of creating a Web service linking plan that indicates a sequence of performing the combination of Web services using the unified preconditions and post conditions, where the ~~first~~ second Web service included in the combination of Web services acquired in the second step is arranged to be performed after the ~~second~~ first Web service included in the combination of Web services based on an order of the logical combination ; and

transmitting the Web service linking plan to the user.

Claim 8 (Currently Amended): The ~~Web service coordination plan creating method~~ according to claim 7, ~~wherein the second step includes further comprising:~~

a ~~fourth~~ first step of matching the predicate of the precondition with the predicate of the user data and matching the predicate of the post condition with the predicate of the user's request in respect to one Web service[[],]; and

a ~~fifth~~ second step of matching the predicate of the precondition with a first predicate including the predicate of the user data unmatched in the fourth step and matching the predicate of the post condition with a second predicate including the predicate of the user's request unmatched in the ~~fourth~~ first step in respect to other Web services excluding the one Web service.

Claim 9 (Currently Amended): The ~~Web service coordination plan creating~~ method according to claim 8, ~~wherein~~ further comprising:

~~the second step is a step of~~ carrying out the ~~fifth~~ second step by calling the ~~fourth~~ first step recursively.

Claim 10 (Currently Amended): The ~~Web service coordination plan creating~~ method according to claim 7, ~~wherein the second step includes~~ further comprising:

a ~~sixth~~ first step of matching the predicate of the precondition with the predicate of the user data and matching the predicate of the post condition with the predicate of the user's request in respect to one Web service[[,]]; and

a ~~seventh~~ second step of matching the predicate of the post condition with a third predicate including the predicate of the user's request unmatched in the ~~sixth~~ first step in respect to other Web services excluding the one Web service.

Claim 11 (Currently Amended): The ~~Web service coordination plan creating~~ method according to claim 10, ~~wherein~~ further comprising:

~~the second step is a step of~~ carrying out the ~~seventh~~ second step by calling the ~~sixth~~ first step recursively.

Claim 12 (Currently Amended): The ~~Web service coordination plan creating~~ method according to claim 7, further comprising:

using an ontology dictionary where a plurality of predicates describing each state by predicate logic notation are classified hierarchically in database form, ~~wherein;~~ and

~~the first step is a step of~~ creating the matching user data by changing the predicate included in the user's request according to a hierarchical level in the ontology dictionary.

Claim 13 (Currently Amended): A recording medium ~~which records a storing~~  
~~program for causing instructions which, when executed by a computer, cause the computer to~~  
~~carry out a Web service coordination plan creating method which uses user data that makes~~  
~~predicates indicating the states of users and a database that associates preconditions~~  
~~representing, in predicate form, necessary conditions for users to use Web services via an~~  
~~information communication network, with post conditions representing, in predicate form,~~  
~~the result of receiving the Web services to correspond to the Web services, the program~~  
including steps comprising:

~~a first instruction which causes the computer to execute a first step of, when receiving~~  
~~a user's request including search conditions for the Web services, acquiring matching user~~  
~~data in predicate form corresponding to the user's request from a first storage section;~~

~~a second instruction which causes the computer to execute a second step of acquiring~~  
~~from the second storage a combination of Web services which satisfies the user's request by~~  
~~logically combining the preconditions and post conditions for a plurality of Web services~~  
~~including a first Web service having the preconditions matching with the user data and a~~  
~~second Web service having the post conditions matching with the user data; and~~

~~a third instruction which causes the computer to execute a third step of creating a Web~~  
~~service linking plan where the first Web service included in the combination acquired in the~~  
~~second step is arranged to be performed after the second Web service included in the~~  
~~combination based on an order of the logical combination~~

storing user data arranged as predicates having predicate arguments, each predicate  
argument indicating a value representing a state of a user;

storing a database that associates preconditions representing, in predicate form,  
necessary conditions for users to use Web services via an information communication

network, with post conditions representing, in predicate form, the result of invoking the corresponding Web services, the precondition and post condition predicates in the second storage including predicate arguments represented as variables;

receiving a user's request including search conditions for the Web services;

acquiring matching user data in predicate form corresponding to the user's request ;

acquiring a combination of Web services which satisfies the user's request by logically combining preconditions and post conditions for a plurality of Web services including a first Web service having a precondition matching the user data and a second Web service having a post condition matching the user's request;

unifying the preconditions and post conditions for the plurality of Web services acquired from the second storage section by replacing each predicate argument represented as a variable with a corresponding predicate argument representing a value of the state of the user acquired from the first storage section, each occurrence of a same variable being replaced with a same value of the state;

creating a Web service linking plan that indicates a sequence of performing the combination of Web services using the unified preconditions and post conditions, where the second Web service included in the combination of Web services is arranged to be performed after the first Web service included in the combination of Web services; and

transmitting the Web service linking plan to the user.

Claim 14 (Currently Amended): The recording medium according to claim 13, ~~wherein the second instruction includes~~ storing further instructions causing the computer to perform steps comprising:

~~a fourth instruction which causes the computer to execute a fourth~~ first step of matching the predicate of the precondition with the predicate of the user data and matching



the predicate of the post condition with the predicate of the user's request in respect to one Web service[[],,]; and

~~a fifth instruction which causes the computer to execute a fifth~~ second step of matching the predicate of the precondition with a first predicate including the predicate of the user data unmatched in the fourth step and matching the predicate of the post condition with a second predicate including the predicate of the user's request unmatched in the ~~fourth~~ first step in respect to other Web services excluding the one Web service.

Claim 15 (Currently Amended): The recording medium according to claim 14, ~~wherein storing further instructions causing the computer to perform steps comprising:~~

~~the second step is a step of carrying out the fifth~~ second step by calling the ~~fourth~~ first step recursively.

Claim 16 (Currently Amended): The recording medium according to claim 13, ~~wherein the second instruction includes~~ storing further instructions causing the computer to perform steps comprising:

~~a sixth instruction which causes the computer to execute a sixth~~ first step of matching the predicate of the precondition with the predicate of the user data and matching the predicate of the post condition with the predicate of the user's request in respect to one Web service[[],,]; and

~~a seventh instruction which causes the computer to execute a seventh~~ second step of matching the predicate of the post condition with a third predicate including the predicate of the user's request unmatched in the ~~sixth~~ first step in respect to other Web services excluding the one Web service.

Claim 17 (Currently Amended): The recording medium according to claim 16,  
~~wherein~~ storing further instructions causing the computer to perform steps comprising:  
~~the second step is a step of carrying out the seventh~~ second step by calling the ~~sixth~~  
first step recursively.

Claim 18 (Currently Amended): The recording medium according to claim 13, storing  
further instructions causing the computer to perform steps comprising:  
using an ontology dictionary where a plurality of predicates describing each state by  
predicate logic notation are classified hierarchically in database form, ~~wherein;~~ and  
~~the first step is a step of creating~~ the matching user data by changing the predicate  
included in the user's request according to a hierarchical level in the ontology dictionary.